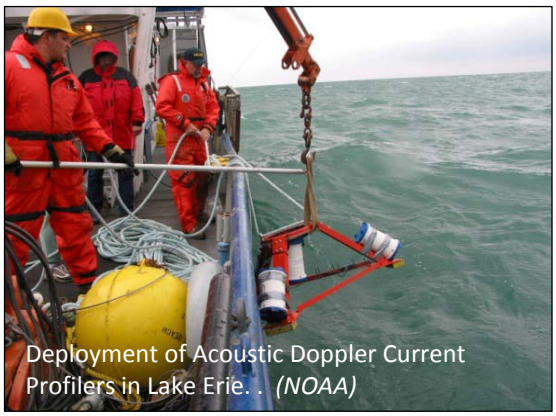
Great Lakes Environmental Research Laboratory

Leading ecosystem research in the Great Lakes and beyond

What Does the Great Lakes Environmental Research Laboratory Do for the Nation?



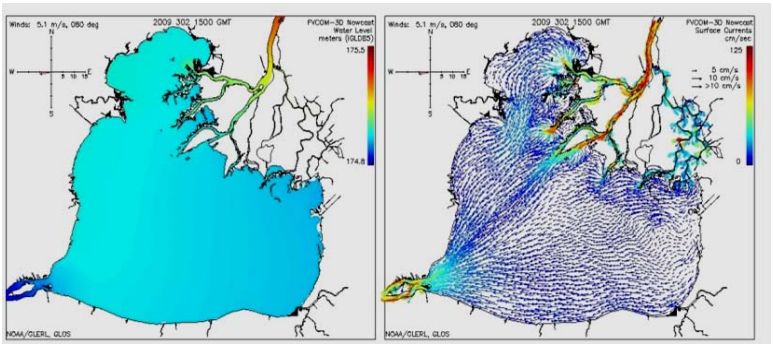
Deployment of Acoustic Doppler Current Profilers in Lake Erie. . *(NOAA)*

The Great Lakes Environmental Research Laboratory (GLERL) was formed in 1974 to provide a focus for NOAA's ecosystem research in the Great Lakes. GLERL develops ecosystem forecasts to predict the effects of biological, chemical, physical, and human-induced changes on ecosystems. GLERL's research and scientific leadership on important issues in both Great Lakes and marine coastal environments leads to new knowledge, stewardship and management tools, approaches, awareness, and services.

Recent Accomplishments

Predicting flows and water levels in the Huron-Erie Connecting Channels: GLERL provides continuous up-to-date forecasts of currents and water levels for the entire St. Clair River - Lake St. Clair - Detroit River interconnecting waterway between Lake Huron and Lake Erie. This new model offers nowcasts and forecasts of water levels and currents, updated eight times per day. http://www.glerl.noaa.gov/res/hecwfs/

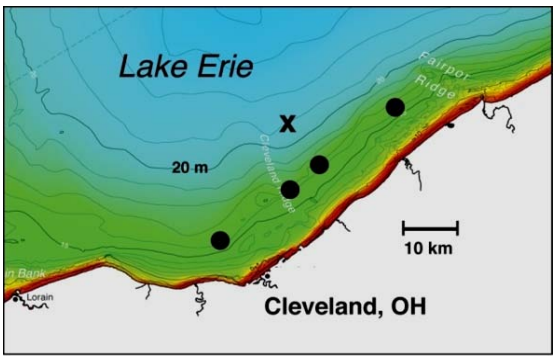
Benefits: The model outputs are used by NOAA HAZMAT and U.S. Coast Guard Search and Rescue for spill response and safe commercial ship operations in this area.



Two of the new Huron-Erie corridor forecast products available on GLERL's website www.glerl.noaa.gov. Lake St. Clair water levels (left) and surface currents (right). Photo credit: NOAA.

Real-time Environmental Coastal Observations Network (ReCON) Ensuring Great Lakes Drinking Water Quality: GLERL is exploring the implications of using marine technology to ensure safe drinking water in the Great Lakes. In collaboration with the Cleveland Water Department (CWD), the ReCON project implemented a buoy-based low dissolved oxygen early warning system in the central basin of Lake Erie near Cleveland, OH. Low oxygen levels can create chemical changes in the water that could impact water processing operations. The ReCON system augments existing CWD sensors by providing real-time observations of changing Lake Erie conditions. CWD operates four drinking water treatment plants serving approximately 1.5 million people in 72 communities in northeast Ohio. noaa.gov/res/recon/

Benefits: Observing water conditions at the ReCON buoys in real-time on the Internet results in an early warning system that allows drinking water managers to place alternate processing and storage techniques on standby during low oxygen events. This ensures quality and safety of drinking water.



Erie RECON Buoy location (X), Water intakes (black dots.) Photo credit: NOAA.

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Advanced Ecosystem Observatory and Forecasting System:
GLERL scientists and engineers deployed an innovative scanning fisheries acoustics system in collaboration with the NOAA Atlantic Oceanographic and Meteorological Laboratory and the NOAA Florida Keys National Marine Sanctuary. The system, when used in concert with real-time physical and chemical sensors, results in a powerful new ecosystem forecasting tool.

Benefits: This ecosystem forecasting approach will provide understanding and key information to managers about how habitat changes impact fish populations.

Great Lakes Aquatic Invasive Species Research: GLERL's ballast water research team participated with Canadian scientists on three shipboard ballast treatment experiments in the Great Lakes. The experiments were aimed at evaluating the use of sodium chloride (brine) to effectively kill freshwater organisms in ballast tanks. Ships that enter the St. Lawrence Seaway heading for the Great Lakes with ballast water that is not compliant with salinity requirements presently have only costly and/or time-consuming alternatives to come into compliance.

Benefits: This research is providing the scientific basis for regulators to consider brine as a treatment option. Since brine is available at major U.S. and Canadian ports in the Great Lakes, it presents a potential cost-effective solution for non-compliant ships.

What's Next for GLERL?

Expansion of Ecosystem Forecasting Capabilities – In an effort to design and create reliable and accurate ecological forecasting capabilities, GLERL consolidated its research activities into four components:

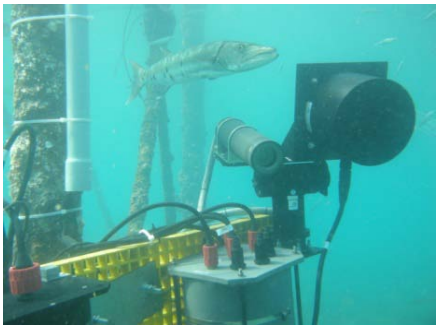
- Physical Environmental Prediction – nearshore and open-lake hydrodynamics, water resources research, climate change and variability, and research into infrequent but significant events;
- Ecological Prediction – foodweb dynamics, long-term examination of specific foodweb components or habitat, understanding and predicting causes, effects, and solutions to problems such as eutrophication (abundant nutrients supporting excessive algae growth), toxic contaminants, invasive species, and human-caused habitat modification;
- Aquatic Invasive Species – understanding and preventing aquatic species invasions, evaluating ecological impacts of aquatic invasive species, and monitoring and reporting the status of aquatic invasions in the Great Lakes;
- Great Lakes Observing System – long-term monitoring and assessment of lake health, Great Lakes CoastWatch, and the Integrated Great Lakes Coastal Observing System.

Research Partnerships

GLERL conducts collaborative research with over 150 research institutions at the state, regional, national, and international levels. GLERL also conducts research with the Cooperative Institute for Limnology and Ecosystems Research (CILER) (a 10-member University consortium) and academic institutions throughout the Great Lakes region.

Budget and Staff

The fiscal year 2010 enacted budget for GLERL is $10.0M. The fiscal year 2011 President's budget request for GLERL is $10.3M. The fiscal year 2010 President's budget request for GLERL was $10.0M. GLERL currently supports 57 permanent full time Federal employees. GLERL is located in Ann Arbor, Michigan.



A high resolution digital video camera and a Biosonics fisheries acoustics system. Data are collected by simultaneously scanning with video and acoustics. Photo credit: NOAA.

Did You Know?

The new Director of GLERL is Dr. Marie Colton, a physical oceanographer who worked with satellites to generate climate, weather, and water products for operational and research use.

During her career she has been an aerospace engineer at NASA, a physicist at the Naval Research Laboratory, an oceanographer at the Fleet Numerical Meteorology and Oceanography Center, and center director of NOAA's satellite service. Prior to coming to GLERL, Colton worked as technical director for NOAA's National Ocean Service, where she oversaw all of the science and technology enterprise from hydrographic mapping to ecology.

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